



26 November 2021

Distributed to:

Chief Executives
Directors of Clinical Governance
Director, Regulation and Compliance Unit

Action required by:

Chief Executives
Directors of Clinical Governance

We recommend you also inform:

Directors, Managers and Staff of:

- Infection Prevention and Control
- Engineering / Environmental Services
- Procurement
- Directors of Departments

Clinicians who may use recirculating air devices

Expert Reference Group

Content reviewed by:

NSW Health COVID-19 Ventilation Panel
Representatives from:

- MoH, CEC, ACI, Occ Medicine, CoPs, Mechanical Engineering

Clinical Excellence Commission

Tel: 02 9269 5500
Email:
CEC-COVID19@health.nsw.gov.au

Internet Website:
<http://health.nsw.gov.au/sabs>

Intranet Website:
<http://internal.health.nsw.gov.au/quality/sabs>

Review Date
November 2023

Recirculating air filtration device use in NSW hospitals

Background

Portable recirculating air filtration devices are being promoted as a way of improving the air quality within hospitals to reduce the transmission of COVID-19. The National COVID-19 Clinical Evidence Taskforce has not provided a recommendation for use of these devices in the hospital environment; however some health services are currently using these devices.

Air filtration devices work by pulling air in through a HEPA-filter which removes particles and returns clean air into the room. These devices do not provide fresh air. Fresh air is provided by the mechanical ventilation system, noting some older hospitals will use natural ventilation.

The purpose of this Safety Information Notice is to ensure:

1. the choice to use these devices is informed by evidence
2. where these devices are used, the selection is guided by a technical performance specification. This will ensure that matters such as placement, performance, consumables, maintenance, and spare parts are considered.

Current evidence

In most modern health care facilities, air change rates are a minimum of six per hour which provides a ventilation rate consistent with advice from the World Health Organisation (WHO). The WHO only recommends the use of portable air filtration devices when:

- a minimum of six air changes per hour cannot be achieved
- improvements to the air recirculation is not possible or optimal¹.

The United States Environmental Protection Agency (EPA) details that 'air cleaning may be useful when used along with source control and ventilation, but it is not a substitute for either method'². Understanding the ventilation in any clinical environment used to accommodate patients with COVID-19 is a first step in evaluating its suitability. Details on the design of contemporary hospital ventilation systems can be found in [NSW Health GL2021_014 Engineering Services, Table 8: Ventilation and service requirements](#)³.

There is limited evidence for the use of these devices and most studies are reporting reduction of aerosol exposure and not transmission of SARS-CoV-2^{4, 5, 6, 7, 8, 9, 10}. What little evidence exists for a reduction in disease transmission, none were for COVID-19 and 'none of the studies retrieved were randomized trials with direct evidence'¹¹. Although a recent Australian study has concluded that 'air cleaners may be useful in clinical spaces to help reduce the risk of acquisition of respiratory viruses that are transmitted via aerosols', it did not demonstrate a clinical benefit in reduced transmission, and instead reported on the failure to detect virus in the environment¹².

See page 2 for recommendations



Safety Information 009/21 - Updated

Recommendations

- The research supporting the routine use of portable air filtration devices in hospital settings is not yet conclusive and indications for use are typically based on the failure to detect virus in the environment rather than reduced human to human transmission of COVID-19. In addition, the WHO recommends the use of these devices where the mechanical ventilation system is deficient and not as an adjunct to a well ventilated environment.
- The [Technical Performance Specification](#), attached to this Safety Information advice, should be used to assist LHD/ Networks to select recirculating air filtration devices.
- Operational matters will also need to be considered and implemented to eliminate risks associated with routine cleaning and filter changes. For example, filter changes will not be carried out in clinical areas as a 'safe change' procedure will be needed as is currently the approach used with routine filter changes.
- Consultation with an environmental engineer, work health and safety and infection prevention and control advisors are recommended before purchasing an air filtration device to ensure all issues detailed in this Safety Information advice and Technical Performance Specification have been considered.

Suggested actions for the Local Health Districts/Networks

1. Distribute this Safety Information Sheet to relevant staff including clinical managers, procurement, cleaning and maintenance services.
2. Develop local processes that support the above recommendations.

REFERENCES

1. World Health Organization 2021, *Roadmap to improve and ensure good indoor ventilation in the context of COVID-19*, WHO, Geneva, accessed 8/11/2021, <<https://www.who.int/publications/i/item/9789240021280>>.
2. United States Environmental Protection Agency, 2021, *Air Cleaners, HVAC Filters, and Coronavirus (COVID-19)*, EPA, Washington, accessed 8/11/2021, <<https://www.epa.gov/coronavirus/air-cleaners-hvac-filters-and-coronavirus-covid-19>>.
3. NSW Health, 2021, *GL2021_014 Engineering Services*, p. 52, NSW Health, Sydney, accessed 8/11/21, <https://www1.health.nsw.gov.au/pds/Pages/doc.aspx?dn=GL2021_014>.
4. Lindsley WG, Derk RC, Coyle JP, et al, 2021, *Efficacy of Portable Air Cleaners and Masking for Reducing Indoor Exposure to Simulated Exhaled SARS-CoV-2 Aerosols — United States, 2021*. *Morbidity and Mortality Weekly Journal* 2021;70:972–976, accessed 8/11/2021 <<https://www.cdc.gov/mmwr/volumes/70/wr/mm7027e1.htm>>.
5. Landry SA et al. (2021) *Personal protective equipment does not sufficiently protect against virus aerosol unless combined with advanced air purification or ventilation techniques*, accessed 8/11/2021 <<https://www.medrxiv.org/content/10.1101/2021.09.02.21263008v1>>.
6. Buising K, Schofield R, Irving L, Keywood M, Stevens A, Keogh N, Skidmore G, Wadlow I, Kevin K, Rismanchi B, Wheeler A, Humphries R, Kainer M, Monty J McGain F & Marshall, C (2021). *Use of portable air cleaners to reduce aerosol transmission on a hospital coronavirus disease 2019 (COVID-19) ward*. *Infection Control & Hospital Epidemiology*, accessed 8/11/21 <<https://doi.org/10.1017/ice.2021.284>>.
7. Conway-Morris A, Sharrocks K, Bousfield R, Kermack L, Maes M, Higginson E, Forrest S, Pereira-Dias J, Cormie C, Old T, Brooks S, Hamed I, Koenig A, Turner A, White P, Floto RA, Dougan G, Gkrania-Klotsas E, Gouliouris T, Baker S, Navapurkar V (2021) *The removal of airborne SARS-CoV-2 and other microbial bioaerosols by air filtration on COVID-19 surge units*, medRxiv 2021.09.16.21263684, accessed 8/11/21, <<https://www.medrxiv.org/content/10.1101/2021.09.16.21263684v1>>.
8. Hammond A, Khalid T, Thornton HV, Woodall CA, Hay AD (2021) *Should homes and workplaces purchase portable air filters to reduce the transmission of SARS-CoV-2 and other respiratory infections? A systematic review*. *PLoS ONE* 16(4): e0251049. Accessed 8/11/2021, <<https://doi.org/10.1371/journal.pone.0251049>>.
9. Liu DT, Phillips KM, Speth MM, Besser G, Mueller CA, Sedaghat AR. *Portable HEPA Purifiers to Eliminate Airborne SARS-CoV-2: A Systematic Review*. *Otolaryngol Head Neck Surg*. 2021 Jun 8:1945998211022636, accessed 8/11/2021, <<https://pubmed.ncbi.nlm.nih.gov/34098798/>>.
10. Lee JH, Rounds M, McGain F, Schofield R, Skidmore G, Wadlow I, Kevin K, Stevens A, Marcschall C Irving L, Kainer M, Buising K, Monty J, (2021) *Effectiveness of portable air filtration on reducing indoor aerosol transmission: preclinical observational trials*, *Journal of Hospital Infection*, Accessed 8/11/21, <<https://www.medrxiv.org/content/10.1101/2021.04.26.21256152v1>>.
11. Ehsan S. Mousavi, Negin Kananizadeh, Richard A. Martinello, and Jodi D. Sherman. *COVID-19 Outbreak and Hospital Air Quality: A Systematic Review of Evidence on Air Filtration and Recirculation* *Environmental Science & Technology*, 2021, 55(7), 4134–4147, accessed 8/11/2021, <<https://pubmed.ncbi.nlm.nih.gov/32845618>>.
12. Landry SA et al. (2021) *Personal protective equipment does not sufficiently protect against virus aerosol unless combined with advanced air purification or ventilation techniques*, medRxiv 2021.09.02.21263008, accessed 8/11/2021, <<https://www.medrxiv.org/content/10.1101/2021.09.02.21263008v1>>.
13. Buising K, Schofield R, Irving L, Keywood M, Stevens A, Keogh N, Skidmore G, Wadlow I, Kevin K, Rismanchi B, Wheeler A, Humphries R, Kainer M, Monty J McGain F & Marshall, C (2021). *Use of portable air cleaners to reduce aerosol transmission on a hospital coronavirus disease 2019 (COVID-19) ward*. *Infection Control & Hospital Epidemiology*, accessed 8/11/21 <<https://doi.org/10.1017/ice.2021.284>>.
14. Clinical Excellence Commission, 2021, *COVID-19 Infection Prevention and Control Manual for acute and non-acute healthcare settings*, Sydney, Australia: Clinical Excellence Commission, p.24, accessed 8/11/2021, <https://www.cec.health.nsw.gov.au/_data/assets/pdf_file/0018/644004/COVID-19-IPAC-manual.pdf>.
15. Barnewall RE and Bischoff WE, 2021, *Removal of SARS-CoV-2 bioaerosols using ultraviolet air filtration*. *Infection Control & Hospital Epidemiology*, 42: 1014–1015, <<https://doi.org/10.1017/ice.2021.103>>, accessed 8/11/2021, <<https://pubmed.ncbi.nlm.nih.gov/33706834>>.